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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/732,910	12/09/2003	Younan Xia	53433/2	6911

7590  
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03/23/2007

EXAMINER

ZIMMERMAN, JOHN J

ART UNIT

PAPER NUMBER

1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
31 DAYS	03/23/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

5

<b>Office Action Summary</b>	<b>Application No.</b> 10/732,910	<b>Applicant(s)</b> XIA ET AL.	
	<b>Examiner</b> John J. Zimmerman	<b>Art Unit</b> 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-46 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                      | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## **RESTRICTION REQUIREMENT**

**Restriction to one of the following inventions is required under 35 U.S.C. 121:**

- I. Claims 1-3, drawn to a method of hollow nanostructure comprising identifying a desired shape, forming an optimized yield to that shape and selectively separating nanostructures of that shape, classified in class 209, subclass 659.
- II. Claims 4-14, drawn to a method of manufacturing silver nanostructures using silver nitrate in ethylene glycol, classified in class 75, subclass 330.
- III. Claims 15-29, drawn to a method of preparing a hollow nanostructure comprising blending a metal salt with a solution of solid nanostructures, classified in class 75, subclass 330.
- IV. Claims 30-32, drawn to a hollow nanostructure comprising a metal alloy having a hollow shape and substantially non-porous walls, classified in class 428, subclass 544.
- V. Claims 33-35, drawn to a to a hollow nanostructure comprising a metal alloy having a hollow shape and substantially porous walls, classified in class 428, subclass 613.
- VI. Claims 36-39, drawn to a method of preparing a nanostructure comprising a first structure encapsulated by a nanoshell comprising plating nanoparticles with a

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different metal and reacting with a solution of another metal salt, classified in class 427, subclass 215.

- VII. Claims 40-46, drawn to a nanostructure core formed of a first metal and a nanoshell, classified in class 428, subclass 570.

**The inventions are distinct, each from the other because of the following reasons:**

Inventions of method groups I, II, III and VI are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions of method groups I, II, III and VI do not share the same required steps and also produce different end products. Group I is drawn to a method of hollow nanostructure comprising identifying a desired shape, forming an optimized yield to that shape and selectively separating nanostructures of that shape. Group II is drawn to a method of manufacturing silver nanostructures using silver nitrate in ethylene glycol. Group III is drawn to a method of preparing a hollow nanostructure comprising blending a metal salt with a solution of solid nanostructures. Group VI is drawn to a method of preparing a nanostructure comprising a first structure encapsulated by a nanoshell comprising plating nanoparticles with a different metal and reacting with a solution of another metal salt.

Inventions of article groups IV, V and VII are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different

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designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions of article groups IV, V and VII do not share the same structures. Group IV is drawn to a hollow nanostructure comprising a metal alloy having a hollow shape and substantially non-porous walls. Group V is drawn to a to a hollow nanostructure comprising a metal alloy having a hollow shape and substantially porous walls. Group VI is drawn to a nanostructure core formed of a first metal and a nanoshell.

Inventions of the process groups (e.g. groups I, II, III and VI) and inventions of the product groups (e.g. groups IV, V and VII) are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the articles of groups IV, V and VII can be made without using a separation step as required by method of Group I. The articles of groups IV, V and VII can be made electroless plating without using a solution of silver nitrate in ethylene glycol as required by method of Group II. The articles of groups IV, V and VII can be made by electroless plating without blending a metal salt with a solution of solid nanostructures as required by method of Group III. The articles of groups IV, V and VII can be made by electroless plating without preparing a nanostructure comprising a first structure encapsulated by a nanoshell comprising plating nanoparticles with a different metal and reacting with a solution of another metal salt as required by method of Group VI.

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In addition, inventions VII and III are directed to an unrelated product and process.

Product and process inventions are unrelated if it can be shown that the product cannot be used in, or made by, the process. See MPEP § 802.01 and § 806.06. In the instant case, the process of group III produces a hollow nanostructure instead of the encapsulated nanostructure of group VII.

In addition, inventions IV-V and VI are directed to an unrelated product and process.

Product and process inventions are unrelated if it can be shown that the product cannot be used in, or made by, the process. See MPEP § 802.01 and § 806.06. In the instant case, the process of group VI produces an encapsulated nanostructure instead of the hollow nanostructure of group IV and group V.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

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The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

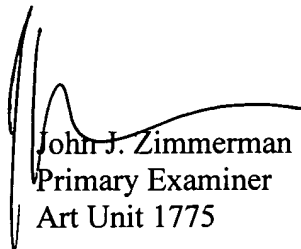
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Jennifer McNeil

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can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John J. Zimmerman  
Primary Examiner  
Art Unit 1775

jjz  
March 20, 2007